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THE BUTTERFLIES OF CRATER LAKE NATIONAL PARK, OREGON

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ABSTRACT

Seventy-eight species of Rhopalocera are recorded for Crater Lake National Park, Oregon. The list is presented in annotated form, with a discussion of conditions in the Park, and of certain of the records.

INTRODUCTION

Most of the specimens on which this paper is based were collected in 1957-1962 inclusive. Most of the field work was done by Huntzinger. Tilden collected in the area in June, 1960, and in August, 1962, adding a number of previously unrecorded species. The original intent had been to do considerably more field work before writing the results, but Huntzinger received another assignment, and other commitments prevented Tilden from doing further research in the area. It seems best to present the results now, so that such work as has been done will not be lost. It seems certain that this list includes the major number of butterfly species to be found in the Park. Others will no doubt be added in time, but it is hoped that the present list will provide a basis for future work.

In Crater Lake National Park, most of the butterfly species are concentrated in a relatively few favored areas. Experience taught that large parts of the Park are depauperate in butterfly fauna.

The dry area north and west of the lake yielded very few species or specimens. The peaks (unlike similar areas in many other mountain masses) support few species not also found at more moderate levels. Emergence dates, however, are naturally later for the same species at higher elevations.

The least collected area of Crater Lake National Park is the

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extreme southwest corner. This lies at a lower elevation than the rest of the Park, and if new records are sought, this should be a likely area. One only record is admitted of a species not actually taken or seen anywhere in the Park. This is *Habrodais grunus* (Bdv.), taken just outside the West Entrance. This species should occur inside the Park, where oaks are found.

Because of the policy of the National Park Service, large series of most species were not collected. There are also several species that were taken only one to a few times. This may reflect either scarcity of the species, or incomplete collecting. Relative abundance was estimated from the number of times a species was seen in the field. Many localities were explored, from which no specimens were taken. Such localities are not mentioned by name. In those cases in which a species was found in a number of localities, and seems to be well-distributed in the Park, this is mentioned under the species annotation.

The senior author has checked all specimens that he could examine. Only a few were unavailable for study. The physical basis for this list is housed in four collections, at least for the present: The Collection of Crater Lake National Park, located at Park Headquarters; The Collection of San Jose State University, San Jose, California; the small private collection of David H. Huntzinger; and the collection of J. W. Tilden. The most of the Crater Lake specimens now in this latter collection will later be placed in the California Academy of Science's collection.

The sequence of families and species is primarily that of dos Passos, 1964. The determinations are those of the senior author, who assumes responsibility for them. Some populations seem to merit confidence at the subspecific level, others do not. Mention is made in each case where the population does not seem to fit any usual named entity.

PREVIOUS WORK

The first specimens retained in the collection of Crater Lake National Park were taken by H. A. Scullen in 1930-1931. Ten of these specimens remain. It is not known if there were originally more. There is also one specimen taken in 1931 by F. Lyle Wynd.

Crater Lake Nature Notes for 1951 has a two-page article (pp. 10-11) on Crater Lake Butterflies, and lists 18 species, some of which were not taken by the present authors. No specimens were found as a basis for this list, which is by Donald C.

Lowrie. Therefore the determinations cannot be checked, but there seems to be no good reason to doubt them. The article also describes outbreaks of the California Tortoise-shell (*Nymphalis californica*) for 1930-1931, and for 1951. The bulk of the specimens in the collection of Crater Lake National Park were placed there by the junior author during the years 1957-1960.

BUTTERFLY HABITATS OF THE PARK

Crater Lake National Park is situated in Klamath County, Oregon. Elevations within the Park range from 4500 ft. at the South Boundary and 5956 ft. at the North Entrance, to 8938 ft. at the summit of Mt. Scott, located in the northeast part of the Park. The high points around the Rim of the Lake exceed 8000 ft. The greater part of the Park lies between 6000 and 7000 ft. in elevation.

In spite of its name, Crater Lake is not in fact a crater, but a caldera, caused by the collapse inwardly of Mt. Mazama. Portions of the present Rim have been glaciated. Much of the entire Park has been covered deeply by pumice and scoria, ejected at the time of the collapse. On such soils the flora is sparse and lacking in variety, with few butterfly food plants present. As a result, the butterfly fauna of such areas is correspondingly poor. However, certain butterfly species, the food plants of which are present, reach good populations in these areas.

It is believed that much of the flora was destroyed by the glowing avalanche of pumice and scoria at the time of the collapse. This has been discussed by Tilden (1963b). The flora that has regrown is uneven in distribution and its density seems to depend inversely on the depth to which pumice covered the surface. Areas of light pumice fall recovered more rapidly and more completely, and now have the densest and most varied flora, and the greatest variety of butterfly species as well.

The Park is drained by several small streams, which run down the slope and out of the Park. Sand Creek, running east out of the Park at the now unused South Entrance, runs through an area of heavy pumice fall, and supports along its course a rather meager number of plant species. Annie Creek, running south out of the Park, flows through an area that has largely recovered, especially where it reaches the South Boundary. The canyon of Annie Creek is at times rather spectacular, and there are small meadows and groves of stream-side trees. This area, which lies slightly east of the road on which one enters from the south, and which extends from Annie Creek Station south

out of the Park, is the most favored part of the Park for butterflies, and several species were taken only here.

On the South Boundary on the margin of Annie Creek there are meadows and forest glades, mixed with sagebrush and *Eriogonum,* where fly several species that barely enter the Park at this point. The dirt road that runs east across Annie Creek at the South Boundary leads into an area of mixed coniferous forest, meadow, streamside vegetation, aspen grove, and sagebrush, offering the greatest number of habitats in the Park, and showing at present little effect of pumice fall.

Small montane meadows occur at several localities in the Park. Among these are Pole Creek Meadows, the meadows below Vidae Falls, and those in the vicinity of Kerr Notch. These meadows support populations of certain butterflies. Other favored localities are near Park Headquarters, and on the glaciated portions of the Rim, where pumice is absent or less evident.

The Pumice Desert supports very few butterflies, and these appear to originate elsewhere. Few if any seem to develop there.

The higher points around the Rim of the Lake may be considered subalpine in nature. The butterfly species in these localities are few, but some species occur in fair numbers. *Speyeria egleis* is found here more commonly than it is elsewhere in the Park.

An annotated list of the butterfly species so far known to occur in Crater Lake National Park follows. Collectors' names are given in parentheses. References to Lowrie's 1951 paper are cited as Lowrie (1951). As stated above, no specimens are known to support these records. For the collections, the following abbreviations are used: Crater Lake National Park Collection, CLNP; San Jose State University Collection, SJSU; J. W. Tilden, JWT; David H. Huntzinger, DHH.

Hesperiidae

1. *Ochlodes sylvanoides* (Bdv.)
   South Boundary, 11.VIII.62 (Tilden) (JWT). Very common, both sexes, though apparently not previously reported in the Park.
2. *Polites sabuleti* (Bdv.)
   South Boundary, 11.VIII.62 (Tilden); Pole Creek, 25.VII.59; Annie Springs, 16.VII.57, 30.VII.58, 3.VIII.59; Park Headquarters, 28.VII.57; "C. L. N. P.", 27.VIII.58 (all Hunt-

zinger); East Boundary, 11.VIII.62 (Tilden). MacNeill, who examined all of the skippers for this study, noted that these specimens represent an unnamed population of *Polites sabuleti.* However, considering the variability of this species, it seems unnecessary to add any more names. The senior author has specimens of three other populations of *P. sabuleti* that he has for many years been reluctant to name.

3. *Polites sonora* (Scud.)
South Utility Area, 1.VII.59 (Huntzinger, JWT). So far as known, these fresh specimens (2 ♂ ♂) are the only ones so far examined from the Park. MacNeill notes that they seem to represent a blend zone between *P. sonora sonora,* and *P. sonora siris,* being darker below than usual *sonora,* but by no means as dark as *siris.*
4. *Hesperia harpalus oregonia* (Edw.)
Well-distributed throughout the Park in the meadows. Greatly attracted to flowers. All records are for late July and August. Determination by MacNeill.
5. *Hesperia juba* (Scud.)
South Boundary, 11.VI.59 (♂); Annie Springs, 18.VI.59 (♀), (both Huntzinger, JWT), both much worn. The apparent scarcity of this species may be an artifact of collecting. It may fly earlier than most of the collecting was done.
6. *Carterocephalus palaemon* (Pallas)
South Boundary, 11.VI. 59 (Huntzinger). Taken within the Park only the one time. The location of this specimen is in doubt; it was not seen in any of the collections.
7. *Pyrgus ruralis* (Bdv.)
South Utility Area, 11.VI.59 (♂), 14.VI.59 (♂); Vidae Falls, 25.VI.58 (♂) (all Huntzinger) (CLNP); South Boundary, 22.VI.60 (♂) (Tilden, JWT). Found sitting on the ground in openings.
8. *Erynnis icelus* (Scud. & Burg.)
South Boundary, 11.VI.59 (2 ♂ ♂) (Huntzinger); same, 22-23.VI.60 (3 ♂ ♂) (Tilden); Annie Creek Road, 9.VII.64 (♀) (Tilden); all JWT. Found streamside, in vicinity of willows and *Populus.* Determination by J. M. Burns.
9. *Erynnis persius* (Scud.)
South Boundary, 11.VI.59 (♂) (Huntzinger); same, 22-23. VI.60 (4 ♂ ♂) (Tilden) (all JWT). Found together with *Erynnis icelus.* In New England, Scudder found that *E.*

persius larvae ate *willow* and *Populus*. The food plants for this Oregon population are unknown. Burns labelled these as *E. persius* complex.

10. *Erynnis pacuvius lilius* (Dyar)
Annie Springs 4.VIII.58 (♂); South Boundary, 11.VI.59 (♂) (both Huntzinger); same, 22-23.VI.60 (♂ ♀) (Tilden) (all JWT). Found in the lower southern part of the Park where its presumed food plant, *Ceanothus velutinus,* is common and forms an understory in the Ponderosa Pine forest.

11. *Thorybes mexicana nevada* (Scud.)
Pole Creek, 6.VII.59 (♂); Park Headquarters, 17.VII.59 (♀) (both Huntzinger, both JWT). This species appears to be quite scarce in the Park. These specimens were taken at an intermediate elevation. Why it should seem to be absent from higher elevations is not clear.

Papilionidae

12. *Parnassius clodius claudianus* Stichel
Fairly common, especially around the Rim, where in places may be found quantities of its food plant, *Dicentra.* Two species of *Dicentra, D. formosa* and *D. uniflora,* occur in the Park; *D. formosa* is the larger and more common species. At the time this work was done in Crater Lake NP, the life history of *P. clodius* was not known. In the Sierra Nevada of California, at intermedite levels, the larvae, which are purplish black with yellow markings (and look a good deal like certain millipedes), may be found in the day time under the leaves at the base of the plants. The subspecies there is usually considered to be *P. c. sol.*

Lowrie (1951) called the Crater Lake *Parnassius, baldur,* but they seem closer to *claudianus.*

13. *Papilio zelicaon* Lucas
Reported by Lowrie (1951). Seen, but not taken, by Huntzinger. There is no specimen in the CLNP collection.

14. *Papilio rutulus* Lucas
South Boundary, 20.VII.58 (Huntzinger, CLNP); same, 22.VI.60 (♂) (Tilden, JWT).

15. *Papilio eurymedon* Lucas
South Boundary, 20.VII.58 (Huntzinger, CLNP). The Papilios are not as scarce as the few records would imply. Much of the Park is steep and offers few opportunities to take these soaring butterflies.

Pieridae

16. *Neophasia menapia menapia* (F. & F.)
Whitehorse Camp, 25.VIII.30 (H. A. Scullen) (CLNP); "C. L. N. P.", 22.VIII.58 (Huntzinger, CLNP); listed by Lowrie (1951). This late species is probably more common after most of the summer collectors have gone.

17. *Pieris beckerii beckerii* Edw.
Listed by Lowrie (1951). The specimen does not seem to be in the Park collection. However, there seems to be no reason why the species should not occur in the Park, since it has been found in the lower Sand Creek Area outside the Park.

18. *Pieris sisymbrii* Bdv.
The Watchman, 13.VII.59 (Huntzinger, CLNP). The single record may be late for this usually early species.

19. *Pieris protodice* Bdv. & Lec.
Sun Notch, 8.X.53 (R. C. Wood, CLNP); Kerr Notch, 11. VIII.62 (Tilden, JWT); Lowrie, 1951, lists *Pieris protodice vernalis* Edw.

20. *Pieris occidentalis occidentalis* Reak.
Near Union Peak, 13.VII.59; Park Headquarters, 10.VII.59 (both Huntzinger). Normal-looking *P. occidentalis,* not form *calyce* Edw.

21. *Pieris napi* (L.), probably *marginalis* Scud.
North Junction, 10.VII.68 (Huntzinger). This species should be more easily found earlier in the season.

22. *Pieris rapae* (L).
Park Headquarters, 20.VII.59 (Huntzinger); Kerr Notch, 11. VIII.62 (worn) (Tilden) (both JWT). It is evident that North Junction, 10.VII.68 (Huntzinger); Kerr Notch, 11. this introduced pest has invaded the Park.

23. *Colias eurytheme* Bdv.
Taken by Scullen, Park Headquarters, 2.IX.30 and East Entrance, 28.VIII.30. Listed also by Lowrie, 1951. Taken several times and seen frequently during the present study. Found throughout the Park. All specimens seen were the summer form *amphidusa* Bdv.

24. *Anthocharis sara flora* Wright
Sun Creek, 23.VI.60 (♂) (P. A. Fosterla); Park Headquarters, 15.VI.60 (♀) (Huntzinger) (both JWT). Others were seen but not taken.

Lycaenidae

25. *Habrodais grunus herri* Field
Two miles west of Crater Lake National Park, Rogue River National Forest, 1.IX.59 (1 ♂ 2 ♀ ♀, worn) (JWT). This species, the larvae of which feed on oaks, especially *Quercus chryslepis,* may occur in the southwest corner of the Park. For this reason, these specimens from just outside the Park are included here.

26. *Satyrium behrii behrii* (Edw.)
South Boundary, 11.VIII.62 (♂) (Tilden, JWT). Much of the Park seems unsuited to this species and its food plant, *Purshia* (Bitter Brush, Antelope Brush).

27. *Satyrium saepium* (Bdv.)
Park Headquarters, 31.VII.59 (Huntzinger, CLNP). This species, the larvae of which feed on various species of *Ceanothus,* should be more prevalent than this one record would indicate.

28. *Satyrium californicum* (Bdv.)
South Boundary, 11.VIII.62, common but worn (Tilden, CLNP, JWT). Should be common in its proper season, along the southern part of the Park.

29. *Incisalia augustinus iroides* (Bdv.)
South Boundary, 11.VI.59, South Utility Area, 14.VI.59 (both Huntzinger, CLNP). These two records, from the southern limits of the Park, are all for this species. It should be more widely distributed.

30. *Incisalia eryphon eryphon* (Bdv.)
This pine-feeding species is the most generally distributed hairstreak in the Park. It is very unobtrusive, sitting on pine foliage or visiting flowers of Pussy Paws (*Calyptridium umbellatum*).

31. *Mitoura spinetorum* (Hew.)
South Boundary, 22-23.VI.60 (Huntzinger & Tilden, CLNP, JWT). Several specimens, at flowers of *Calyptridium.* All were worn. The food plants, species of Dwarf Mistletoe (*Arceuthobium*) are common, but the butterfly is quite irregular in distribution.

32. *Mitoura nelsoni* (Bdv.)
South Boundary, 23.VI.60 (Tilden, JWT). One only, a ♂ in good condition, at flowers of *Calyptridium.* A close examination of the area yielded no others. Associatel with Incense Cedar, the presumptive food plant.

33. *Callophrys lemberti* Tilden

Arent Peak, 3.VII.58 (Huntzinger, CLNP); The Watchman, 12.VII.59 (Huntzinger, JWT); South Boundary, 22.VII.60 (Tilden, JWT). This recently recognized species seems not to be abundant anywhere in its known range. It should be looked for at high elevations. The South Boundary specimen is unexpected, and is badly worn. It may be referable to some other species, but its condition makes identification uncertain. It is left here since no other species of the genus than *lemberti* is found in the Park.

34. *Lycaena heteronea gravenotata* Klots
South Boundary, 11.VIII.62 (Tilden, JWT). A single ♀, worn but recognizable. The heavy spotting UNH indicates that it represents *gravenotata* Klots, which has been taken at Diamond Lake, just north of Crater Lake. Collecting in July should locate fresh material in the Park.

35. *Lycaena editha* (Mead), near *montana* Field
South Boundary, 22.VI.60 (Tilden, CLNP); same, 11.VIII.62 (Tilden, JWT). Both males, at flowers of Pussy Paws (*Calyptridium*). Widely distributed in the West, this species should occur more commonly and at higher elevations than these two specimens indicate.

36. *Lycaena mariposa* Reak.
The most common copper in the Park, often found at flowers in the meadows of the Annie Creek drainage, flying from late June to August. The specimens from the park are not entirely typical *mariposa,* but show darkening, especially of the outer edge both above and below, and are somewhat intermediate to *penrosae* Field.

37. *Lycaena nivalis nivalis* (Bdv.)
Park Headquarters, 31.VII.59 (Huntzinger, DHH); Vidae Falls, 28.VIII.59 (Huntzinger, JWT); Kerr Notch, 8.VIII.58 (Huntzinger, CLNP); same, 10.VII.59 (Huntzinger, DHH); same, 11.VIII.62 (Tilden, JWT); also listed by Lowrie, 1951. The few records are clustered on the south and east shoulders of Mt. Mazama, from Park Headquarters to Kerr Notch, at median elevations. These localities show less effect from the pumice fall. These are nearer to *nivalis* from the Sierra Nevada, than they are to *browni* dos Passos, which occurs further north and east.

38. *Lycaena helloides helloides* (Bdv.)
South Boundary, 20.VII.58 (Huntzinger, CLNP, JWT); same, 11.VI.59 (Huntzinger, JWT); same, 22-24.VI.60 (Huntzinger & Tilden, JWT); Lost Creek, 11.VI.59 (Huntzinger,

DHH); North Entrance, 9.VII.58 (Huntzinger, CLNP). Common along the southern edge of the Park.

39. *Lycaena cupreus cupreus* (Edw.)
South Boundary, 22-23.VI.60 (3♂♂ 1♀) (Tilden, JWT). The finding of this species, usually associated with high elevations, at a moderate elevation and in one locality only, is a bit puzzling. All were found on a small sandy streamside flat, visiting flowers of *Calyptridium*. Others were seen but not taken.

40. *Lycaeides argyrognomon ricei* (Cross)
This large showy Blue is one of the characteristic species of the Park, and apparently of the Cascades in general. It flies from late June to at least mid-August, and may be found along roadsides as well as in the meadows. The subspecific name *ricei* is used, following Nabokov (1949), but the late F. Chermock informed me (in Litt.) that he had seen the type of *ricei* Cross, and that in his estimation it was a specimen of some subspecies of *Plebejus icarioides*, and for that reason, he had proposed the name *fretchini* Chermock for the Oregon population of *argyrognomon*.

41. *Plebejus saepiolus* (Bdv.)
Common in the moist meadows on the south and east shoulders of the mountain. These appear to represent an unrecognized population. The males are large and brightly colored; the females are completely brown, and have the submarginal lunules of the hind wing developed in most individuals. However, there are so many recognizably different populations of *saepiolus* that it seems useless to propose more names at present.

42. *Plebejus icarioides* (Bdv.)
In Crater Lake National Park, as in many parts of the western states, this is the commonest and the most ecologically tolerant of the larger "Blues". It is always associated with perennial lupines, and is usually found wherever these grow. The males of the Crater Lake population have wider dark borders than most, and look most like the Arizona subspecies, *P. i. buchholzi* dos Passos.

43. *Plebejus lupini* (Bdv.)
Annie Springs, 4-6.VIII.58 (Huntzinger, CLNP); Kerr Notch, 8.VIII.58 (Huntzinger, JWT); The Watchman, 13.VII.59 (Huntzinger, JWT); South Boundary, 23.VI.60 (Tilden, JWT). Lowrie (1951) lists *Plebejus acmon* (West. & Hew.), which may occur in the Park, or he may have referred to

the insect here treated as *lupini* Bdv. Without specimens, this point cannot be settled. The females from Crater Lake are unusually large and dark.

44. *Agriades aquilo podarce* (F. & F.)
Boundary Springs, 5.VII.57 (Huntzinger, JWT); Pole Creek, 8.VIII.58 (Huntzinger, CLNP); same, 6.VII.59 (Huntzinger, JWT, DHH); same, 23.VII.59 (Hountzinger, DHH); Annie Springs, 6.VII.58. This species is found only in very wet or marshy meadows, and so far has been taken in the Park only in the Annie Creek drainage. The Crater Lake population resembles *podarce* from the Sierra Nevada of California, much more closely than it does *megalo* McDunnough from further north.

45. *Everes amyntula* (Bdv.)
South Boundary, 23.VI.60 (2♀ ♀) (Tilden, JWT); South Utility Area, 23.VI.60 (♂) (Huntzinger, JWT). The male from the South Utility Area is much larger than the two females from the South Boundary.

46. *Shijimiaeoides battoides oregonensis* (B. & McD.)
Generally distributed in the Park, flying in June at the South Boundary, and in August on the slopes of Mt. Scott. It is fairly common, but inconspicuous, staying close to its food plants, which in the Park seem to include several species of perennial *Eriogonum.*

47. *Glaucopsyche piasus piasus* (Bdv.)
Pole Creek, 23.VI.59 (Huntzinger); South Boundary, 23.VI. 60 (2♂ ♂) (Tilden, JWT). This is seldom a common species.

48. *Glaucopsyche lygdamus columbia* Skin.
Rather common; a number taken and others seen. It flies a little earlier than the other large blues, and is worn by mid-July. Found flying along trails as well as over the meadows.

49. *Celastrina argiolus echo* (Edw.)
Fairly common, flying early in the year for this elevation, the records mostly in early and mid-June; no records after early July, and these worn. This usually multivoltine species would appear to be one-brooded in the higher mountains of the west.

Nymphalidae

50. *Limentitis lorquini* (Bdv.)

Annie Springs, 19.VI.58 (Huntzinger, CLNP); Vidae Falls, 29.VII.59 (Huntzinger, CLNP); Pole Creek, 11.VIII.62 (Tilden, JWT). Reported by Lowrie (1951). More common than these few records indicate. The brick red of the wing tips is reduced, approaching the subspecies (or form) *burrisonii* Maynard.

51. *Adelpha bredowii californica* (Butler)
South Boundary, 20.VI.58 (Huntzinger, CLNP); The Watchman, 14.VIII.59 (Huntzinger, CLNP). This species would not be expected to occur commonly in the Park, because of the absence from much of the region, of the oaks with which it is associated. However, it is a wide-ranging species that sometimes occurs as a straggler far from its point of origin. It should be found regularly in the southwest corner of the Park.
52. *Vanessa atalanta rubria* (Fruhst.)
Park Headquarters, 10.VIII.60 (Huntzinger, CLNP, 2 specimens). The single record of this conspicuous butterfly may indicate actual scarcity in the Park.
53. *Cynthia virginiensis* (Drury)
Listed by Lowrie (1951). No specimens seem to exist for Crater Lake National Park. Lowrie (p. 10, second paragraph, line 4) mentions the "Painted Lady," but *Cynthia cardui* does not appear on Lowrie's list on p. 11.
54. *Cynthia cardui* (L.)
North Entrance, 30.VII.57 (Huntzinger, JWT); same, 17.VII.58 (Huntzinger, CLNP); Annie Springs, 10.VIII.58 (Huntzinger, JWT). Reported by Huntzinger to be very common in Crater Lake National Park during the summer of 1958. This was an outbreak year, and a migration year for this species over the southwestern United States. The Painted Lady is commoner in the Park than the few records show.
55. *Cynthia anabella* Field
Huntzinger reports seeing this species several times when he was not collecting. He also has seen a colored slide taken by Richard Brown when Brown was an Assistant Park Naturalist in 1957. It is also reported by Lowrie (1951). However, to date no actual specimen for the Park is known to exist.
56. *Junonia coenia* (Hbn.)
Huntzinger has seen a colored slide of this species, taken in the Park. No specimen seems to exist. It is entirely possible

that this and the two previous doubtful species may occur within Crater Lake National Park, but evidence in the form of specimens would be desirable.

57. *Nymphalis californica californica* (Bdv.)
Huntzinger found this species in outbreak numbers everywhere in the Park in 1958. Tilden found similar outbreak numbers in all parts of the Park that he visited in 1962. The *Ceanothus* was nearly defoliated in many places. Lowrie (1951) describes similar outbreaks for 1930 and for 1951. It appears that Crater Lake National Park is subject to outbreaks of the California Tortoise-shell, as are so many other places in the Pacific States. These outbreaks are in irregular cycles (gradations) and the number of years from peak to peak is not predictable.

58. *Nymphalis milberti furcillata* (Say)
Near Park Headquarters, 22.VIII.30 (Scullen, CLNP); Sleepy Hollow, 15.VI.58 (Huntzinger, CLNP); Top of Wineglass, 5.VII.57 (Huntzinger, JWT); reported by Lowrie (1951) (as *Aglais milberti* Godt.). *N. milberti* occurs in all the western states in the mountains. Overwintering adults appear as soon as the snow is melted.

59. *Nymphalis antiopa* (L.)
Annie Springs, 18.VI.59 (Huntzinger, CLNP). Reported by Lowrie (1951) (as *Aglais antiopa* Linn.). This species must be more common in the Park than records show.

60. *Polygonia faunus rusticus* (Edw.)
Near Park Headquarters, 29.VIII.30 (Scullen, CLNP); South Boundary, 23.VI.60 (Tilden, JWT). Reported by Lowrie, 1951. The South Boundary specimen is much worn, and may be overwintered. The small numbers may reflect the type of collecting. It should be more common, especially along the Annie Creek drainage.

61. *Polygonia zephyrus* (Edw.)
The common Anglewing of the Park, found in forest openings and along trails, often in the vicinity of its food plants, *Ribes* spp. (Currant, Gooseberry). An August specimen is freshly emerged. Individuals noted in June and July are worn, and probably overwintered.

62. *Chlosyne palla* (Bdv.)
South Boundary, 20.VII.58 (Huntzinger, CLNP); same, 23.VI.60 (4 ♂ ♂ 1 ♀) (Tilden, JWT). So far taken in an area of small extent, in the immediate vicinity of Annie Creek where it runs out of the Park. The habitat is moist

and overgrown. These specimens are not referred to any subspecies. They resemble *whitneyi* Behr, from the Sierra Nevada of California, more than they do nominate *palla.*

63. *Chlosyne hoffmanni segregata* (B. & McD.)
Quite generally distributed in the Park, the common checkerspot, from South Boundary to near the Rim at Kerr Notch. It flies in meadows and forest glades, and a wide range of dates indicates a rather long flight period, with later emergence at higher elevations. Since *segregata* was described from the vicinity of Crater Lake National Park, these specimens should be quite typical.

64. *Phyciodes campestris* (Behr)
Park Headquarters, 31.VII.59 (Huntzinger, CLNP); Meadow just below Vidae Falls, 13.VII.59 (Huntzinger, CLNP). This seems to be an uncommon species in the Park. The few specimens appear closest to *montana* Behr.

65. *Phyciodes mylitta* (Edw.)
Union Peak, 13.VII.59 (Huntzinger, CLNP); Park Headquarters, 17.VII.59 & 26.VIII.59 (Huntzinger, CLNP). Rather oddly, these records are for localities well within the Park and at fair elevations, not from the lower levels.

66. *Euphydryas editha lawrencei* Gund.
Arent Peak, 3.VII.58 (Huntzinger, CLNP); East Rim, near base of Mt. Scott, 11.VIII.62 (Tilden, JWT, 1 ♂). The meager records suggest that this is not a common insect in the Park. Both captures are for high elevations and late in the season. While these are here referred to *lawrencei* Gunder, there is some question as to whether they may be *remingtoni* Burdick. There may even be some doubt that *remingtoni* Burdick is distinct from *lawrencei.*

67. *Boloria epithore chermocki* Perk. & Perk.
South Utility Area, 22.VI. 59 (♂) (Huntzinger, JWT); Pole Creek, 22.VI.59 (2 ♂ ♂) (Huntzinger, JWT); same, 11. VIII.62 (♀) (Tilden, JWT); South Boundary, 23.VI.60 (2 ♀ ♀) (Tilden, JWT). So far this species has been taken in the Park only in the Annie Creek drainage. It has been found only in lush streamside situations, but is locally common. A specimen exists in the CLNP collection, data unknown.

68. *Speyeria coronis* (Behr)
Pole Creek, 24.VII.57 (♀) (Huntzinger, JWT); South Boundary, 24.VI.60 (♀) (Tilden, JWT). These are the only records for the Park, and *S. coronis* must be considered

rather uncommon in the area. Outside the Park, along Sand Creek, specimens were taken by Tilden in 1957 and in 1962 (June). All specimens resemble *snyderi* Skinner very closely, and might be referred to this subspecies.

69. *Speyeria zerene* (Bdv.)
South Utility Area, 12.VII.59 (Huntzinger, CLNP); Park Headquarters, 31.VII.59 (Huntzinger, CLNP); South Boundary, 23.VI.60 & 11.VIII.62 (2♂♂ 2♀♀) (Tilden, JWT); Vidae Falls, 10.VIII.62 (♂) (Tilden, JWT); Kerr Notch, 11.VIII.62 (♀) (Tilden, JWT). The several specimens show great variation. Some closely resemble subspecies *conchyliatus* from northern California; others are as light as some specimens from eastern Oregon. This species typifies the range of variation seen in certain *Speyeria* populations in the Crater Lake region, as noted by Tilden (1963).

70. *Speyeria callippee* (Bdv.)
Stewart Falls, 17.VII.57 (♂) (brown disc) (Huntzinger, JWT); North Gate, 9.VII.57 (♂) (green disc) (Huntzinger, JWT). The only two so far found within the boundaries of the Park. This species is quite common east out of the Park in the Sand Creek Basin. The Stewart Falls specimen would fit a series of *liliana* H. Edw. from Lake Co., CA. The North Gate specimen has a dull green disc with the ground color showing through, and resembles the dull green population of the arid Oregon interior. Such variation in two specimens of *S. callippe* shows the futility of attempting subspecific determinations of *Speyeria* from regions inhabited by unstabilized populations, such as are found in the volcanic regions of interior Oregon.

71. *Speyeria egleis* (Behr)
The most common *Speyeria* in the Park, and the only one found in numbers at higher elevations. *S. egleis* from the Sand Creek basin east out of the Park are quite variable, but those taken inside the Park are quite uniform in appearance, and seem referable to *oweni* (Edw.), closely resembling specimens from Mt. Shasta.

72. *Speyeria atlantis dodgei* (Gunder)
North Entrance, 30.VII.57 (♀) (Huntzinger, JWT); Vidae Falls, 28.VII.59 (Huntzinger, CLNP); same, 11.VIII.62 (♀) (Tilden, JWT); South Boundary, 23.VII.60 (♂) (Tilden, JWT); same, 11.VIII.62 (♂♀) (Tilden, JWT). Found in suitable habitats here and there in the Park. Several seen and not taken.

73. *Speyeria hydaspe* (Bdv.)
Pole Creek, 24.VII.59 (♂) (Huntzinger, JWT); Vidae Falls, 28.VII.59 (Huntzinger, CLNP). These seem to be the only records for the Park. The specimens are a bit lighter than *purpurascens* H. Edw. from northern California.

Danaidae

74. *Danaus plexippus plexippus* (L.)
There is a specimen in the CLNP collection. This butterfly must occur in the Park. It has most likely been neglected in the search for less conspicuous species.

Satyridae

75. *Coenonympha california eryngii* H. Edw.
Annie Springs, 18.VI.59 (Huntzinger, CLNP); South Boundary, 22.VI.60 (Tilden, SJSU, JWT). The small numbers probably indicate, not scarcity, but that this insect flies earlier, before most collectors arrive for the summer. It seems to be absent from higher elevations.

76. *Cercyonis pegala boopis* (Behr)
Pole Creek Meadow, 15.VIII.30 (Scullen, CLNP); South Rim Crater Lake National Park, 6.VIII.30 (Scullen, CLNP); reported by Lowrie, 1951. Not taken by Tilden & Huntzinger. Lowrie's inclusion may be on the basis of Scullen's specimens, which are listed in the Crater Lake NP Collection, and in Lowrie, as *alope* Fab.

77. *Cercyonis oeta oeta* (Bdv.)
The most common and widely distributed satyr in the Park. It flies from late June into August, in almost all of the more open and arid habitats.

78. *Oeneis nevadensis nevadensis* (F. & F.)
South Utility Area, 14.VI.59 (Huntzinger, JWT); South Boundary, 20.VII.58, worn (Huntzinger, CLNP); same, 22-24.VI.60, common (Tilden & Huntzinger, SJSU, JWT); Vidae Falls, 10.VIII.62, badly worn (Tilden, JWT). Except for the one record from Vidae Falls, this species seems to be found in the Park only along the southern limits, where it flies in openings and glades in coniferous forest. It is known to have a two year cycle. In the Crater Lake area its periods of abundance are on the even-numbered years.

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